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Approved For Release 2005/04/22 :
TOP SECRET B01709A000500030009-6

MCGWG-D-7/2

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(26 January 1966)

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MEMORANDUM TO [REDACTED] CHAIRMAN OF COMOR MC&G

SUBJECT: Additions and Modifications to Research and Development Requirements for [REDACTED]
[REDACTED] for Mapping, Charting and Geodesy

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1. In accordance with the COMOR MC&G Working Group meeting of 17 January 1966, subsequent paragraphs set forth DoD additions and modifications to the document titled as above dated 16 December 1965, as follows:

a. Brief explanations of the basis for the accuracy requirements stated in paragraphs 3a, b and c, as requested by the Chairman, COMOR MC&G Working Group and

b. Minor substantive modifications posed by the DoD, based on most recent experiences within the DoD.

2. The following subparagraphs set forth the basis for the accuracy requirements stated in 3a, b and c of the document cited in paragraph 1 above:

a. The Military Topographic Mapping Requirements (para 3a) at large scale are based upon the effective employment of tube artillery. The stated accuracies are designed to be commensurate with the precision of cannon delivery capability in order to subject targets to effective lethal fire with the initial salvo directed against them. In the event that degraded map accuracies preclude the successful delivery of the first salvo on target, then, by the time the second or third salvo is "bracketted in", the enemy has been afforded time to take evasive action, thus significantly reducing the lethality of all but the first salvo.

b. The Military Topographic Mapping Requirements (3a) at medium scale, are based on the most effective use possible of tube artillery when large scale maps are not available. These maps have many other extensive uses, none of which are as demanding as its role as a substitute for the large scale maps.

DIA review(s) completed.

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c. The accuracy relationship between widely separated points up to 500 miles, as shown on topographic maps, both medium and large scale (see accuracy requirement for photogrammetric control points in paragraph 3c of reference document), is dependent on the launch-target relationships necessary for Army tactical missiles (Sergeant, Corporal) up to the range of the Pershing missile.

d. The requirements for Aeronautical Chart (para 3b) vertical accuracies are based on the need to know the shape of the terrain for radar predictions necessary for the manned, all-weather, low level penetration of tactical and strategic aircraft. The accuracies relate to radar shadowing and masking effects over the radar range of low flying aircraft.

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3. The following subparagraphs set forth substantive modifications to the document cited in paragraph 1 above recommended by the DoD based on most recent experiences:

a. Paragraph 3d should be revised to include requirements for higher resolution as follows: "Satellite photography should permit interpretation of those features normally required to be shown on maps and charts. These features are detailed in mapping and charting specifications, and available studies. The most critical requirement pertains to features on large scale maps for infantry and artillery use, and specifically those large scale maps which include the combination of cartographic and photographic detail to express features in a complete and precise manner. Generally, the required interpretation capability is reached by a resolution of 5 feet on the ground, including round and square objects for those features represented by 2-1 contrast level on the film, developed to a density of .3 minimum to 1.6 maximum."

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b. In line with subparagraph a above, and recent studies on details interpretable from KH-4 photography, paragraph 4d, Information Content, should be revised as follows: "Analysis of the KH-4 system panoramic photograph at 100-150 nautical miles, reveals that the information content requirements in terms of ground resolution obtainable for medium and large scale maps and charts is approximately [redacted]. This resolution satisfies most mapping and charting requirements except for certain details at large scale, and especially details shown both in cartographic and photographic form on maps validated for use in field operations such as Viet Nam. Generally, medium and small scale maps require less stringent detail interpretation capability, such that most of the cartographic features are interpretable from photography having a resolution of [redacted] on the ground, which could be obtained by present KH-4 systems operating at the altitude of 200-300 nautical miles. However, photography at these higher altitudes would not be adequate for interpretation of 20 to 25% of the features on medium scale topographic maps, would be only marginal for medium scale target charts and, of course, would not meet the interpretation requirements for large scale mapping."

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d. Paragraph 7a, Improved Frame Camera, should be revised as follows: "The 3-inch focal length SI camera, in the KH-4 or similar stereo panoramic system, should be replaced with a longer focal length frame camera. Substitution of a 6 or 8-inch index camera has been suggested as the next logical step in the evolutionary improvement of acquisition system capabilities, particularly as pertains to the KH-4 system. If flown in the proper orbital mode and altitude, this component development will provide an acquisition system capable of meeting all medium scale map and chart accuracy requirements, and nearly satisfy positioning requirements for the immediate future. However, in view of large scale accuracy requirements which would not be fulfilled, and any

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possible changes to longer focal length, higher resolution stereo panoramic photography for intelligence requirements, consideration should be given to a still longer focal length for the index camera."

4. A copy of this memorandum has been furnished to the Military Departments and to [Redacted] DIA COMOR member.

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FOR THE DIRECTOR:

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[Redacted]
DIA Member
COMOR MC&G Working Group

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